

# Sequence Listing

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<110> NEXGEN BIOTECHNOLOGIES, INC.

<120> Production of Transformed Plants Expressing Thyroid Stimulating Hormone Receptor

<150> KR2002-38064

<151> 2002-07-02

<160> 2

<170> KopatentIn 1.71

<210> 1

<211> 2292

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1) .. (2289)

<400> 1

atg agg ccg gcg gac ttg ctg cag ctg gtg ctg ctg ctc gac ctg ccc 48

Met Arg Pro Ala Asp Leu Leu Gln Leu Val Leu Leu Leu Asp Leu Pro

1 5 10 15

agg gac ctg ggc gga atg ggg tgt tcg tct cca ccc tgc gag tgc cat 96

Arg Asp Leu Gly Gly Met Gly Cys Ser Ser Pro Pro Cys Glu Cys His

20 25 30

cag gag gag gac ttc aga gtc acc tgc aag gat att caa cgc atc ccc 144

Gln Glu Glu Asp Phe Arg Val Thr Cys Lys Asp Ile Gln Arg Ile Pro

35 40 45

agc tta ccg ccc agt acg cag act ctg aag ctt att gag act cac ctg 192

Ser Leu Pro Pro Ser Thr Gln Thr Leu Lys Leu Ile Glu Thr His Leu

50 55 60

aga act att cca agt cat gca ttt tct aat ctg ccc aat att tcc aga 240

Arg Thr Ile Pro Ser His Ala Phe Ser Asn Leu Pro Asn Ile Ser Arg

# Sequence Listing

| 65  | 70  | 75  | 80  |     |
|---|-----|-----|-----|-----|
| atc tac gta tct ata gat gtg act ctg cag cag ctg gaa tca cac tcc |     |     |     | 288 |
| Ile Tyr Val Ser Ile Asp Val Thr Leu Gln Gln Leu Glu Ser His Ser |     |     |     |     |
| 85  | 90  | 95  |     |     |
| ttc tac aat ttg agt aaa gtg act cac ata gaa att cgg aat acc agg |     |     |     | 336 |
| Phe Tyr Asn Leu Ser Lys Val Thr His Ile Glu Ile Arg Asn Thr Arg |     |     |     |     |
| 100   | 105 | 110 |     |     |
| aac tta act tac ata gac cct gat gcc ctc aaa gag ctc ccc ctc cta |     |     |     | 384 |
| Asn Leu Thr Tyr Ile Asp Pro Asp Ala Leu Lys Glu Leu Pro Leu Leu |     |     |     |     |
| 115   | 120 | 125 |     |     |
| aag tcc ttg gca ttt tca aac act gga ctt aaa atg ttc cct gac ctg |     |     |     | 432 |
| Lys Ser Leu Ala Phe Ser Asn Thr Gly Leu Lys Met Phe Pro Asp Leu |     |     |     |     |
| 130   | 135 | 140 |     |     |
| acc aaa gtt tat tcc act gat ata ttc ttt ata ctt gaa att aca gac |     |     |     | 480 |
| Thr Lys Val Tyr Ser Thr Asp Ile Phe Phe Ile Leu Glu Ile Thr Asp |     |     |     |     |
| 145   | 150 | 155 | 160 |     |
| aac cct tac atg acg tca atc cct gtg aat gct ttt cag gga cta tgc |     |     |     | 528 |
| Asn Pro Tyr Met Thr Ser Ile Pro Val Asn Ala Phe Gln Gly Leu Cys |     |     |     |     |
| 165   | 170 | 175 |     |     |
| aat gaa acc ttg aca ctg aag ctg tac aac aat ggc ttt act tca gtc |     |     |     | 576 |
| Asn Glu Thr Leu Thr Leu Lys Leu Tyr Asn Asn Gly Phe Thr Ser Val |     |     |     |     |
| 180   | 185 | 190 |     |     |
| caa gga tat gat ttc ttt ggg aca aag ctg gat gct gtt tac cta aac |     |     |     | 624 |
| Gln Gly Tyr Asp Phe Phe Gly Thr Lys Leu Asp Ala Val Tyr Leu Asn |     |     |     |     |
| 195   | 200 | 205 |     |     |
| aag aat aaa tac ctg aca gtt att gac aaa gat gca ttt gga gga gta |     |     |     | 672 |
| Lys Asn Lys Tyr Leu Thr Val Ile Asp Lys Asp Ala Phe Gly Gly Val |     |     |     |     |
| 210   | 215 | 220 |     |     |
| tac agt gga cca agc ttg ctg gac gtg tct caa acc agt gtc act gcc |     |     |     | 720 |
| Tyr Ser Gly Pro Ser Leu Leu Asp Val Ser Gln Thr Ser Val Thr Ala |     |     |     |     |

## Sequence Listing

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| 225   | 230 | 235 | 240 |      |
|---|-----|-----|-----|------|
| ctt cca tcc aaa ggc ctg gag cac ctg aag gaa ctg ata gca aga aac |     |     |     | 768  |
| Leu Pro Ser Lys Gly Leu Glu His Leu Lys Glu Leu Ile Ala Arg Asn |     |     |     |      |
| 245   | 250 | 255 |     |      |
|   |     |     |     |      |
| agc tgg act ctt aag aaa ctt gca ctt tcc ttg agt ttc ctt cac ctc |     |     |     | 816  |
| Ser Trp Thr Leu Lys Lys Leu Ala Leu Ser Leu Ser Phe Leu His Leu |     |     |     |      |
| 260   | 265 | 270 |     |      |
|   |     |     |     |      |
| aca cgg gct gac ctt tct tac cca agc cac tgc tgt gct ttt aag aat |     |     |     | 864  |
| Thr Arg Ala Asp Leu Ser Tyr Pro Ser His Cys Cys Ala Phe Lys Asn |     |     |     |      |
| 275   | 280 | 285 |     |      |
|   |     |     |     |      |
| cag aag aaa atc aga gga atc ctt gag tcc ttg atg tgt aat gag agc |     |     |     | 912  |
| Gln Lys Lys Ile Arg Gly Ile Leu Glu Ser Leu Met Cys Asn Glu Ser |     |     |     |      |
| 290   | 295 | 300 |     |      |
|   |     |     |     |      |
| agt atc gag acg ttg cgc cag aga aaa tct gtg aat gcc ttg aat agc |     |     |     | 960  |
| Ser Ile Glu Thr Leu Arg Gln Arg Lys Ser Val Asn Ala Leu Asn Ser |     |     |     |      |
| 305   | 310 | 315 | 320 |      |
|   |     |     |     |      |
| ccc ctc cac cag gaa tat gaa gag aat ctg ggt gac agc att gtt ggg |     |     |     | 1008 |
| Pro Leu His Gln Glu Tyr Glu Glu Asn Leu Gly Asp Ser Ile Val Gly |     |     |     |      |
| 325   | 330 | 335 |     |      |
|   |     |     |     |      |
| tac aag gaa aag tcc aag ttc cag gat act cat aac aac gct cat tat |     |     |     | 1056 |
| Tyr Lys Glu Lys Ser Lys Phe Gln Asp Thr His Asn Asn Ala His Tyr |     |     |     |      |
| 340   | 345 | 350 |     |      |
|   |     |     |     |      |
| tac gtc ttc ttt gaa gaa caa gag gat gag atc att ggt ttt ggc cag |     |     |     | 1104 |
| Tyr Val Phe Phe Glu Glu Gln Glu Asp Glu Ile Ile Gly Phe Gly Gln |     |     |     |      |
| 355   | 360 | 365 |     |      |
|   |     |     |     |      |
| gag ctc aaa aac ccc cag gaa gag act cta caa gct ttt gac agc cat |     |     |     | 1152 |
| Glu Leu Lys Asn Pro Gln Glu Glu Thr Leu Gln Ala Phe Asp Ser His |     |     |     |      |
| 370   | 375 | 380 |     |      |
|   |     |     |     |      |
| tat gac tac acc ata tgt ggg gac agt gaa gac atg gtg tgt acc ccc |     |     |     | 1200 |
| Tyr Asp Tyr Thr Ile Cys Gly Asp Ser Glu Asp Met Val Cys Thr Pro |     |     |     |      |

# Sequence Listing

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| 385   | 390 | 395 | 400 |      |
|---|-----|-----|-----|------|
| aag tcc gat gag ttc aac ccg tgt gaa gac ata atg ggc tac aag ttc |     |     |     | 1248 |
| Lys Ser Asp Glu Phe Asn Pro Cys Glu Asp Ile Met Gly Tyr Lys Phe |     |     |     |      |
| 405   | 410 | 415 |     |      |
| ctg aga att gtg gtg tgg ttc gtt agt ctg ctg gct ctc ctg ggc aat |     |     |     | 1296 |
| Leu Arg Ile Val Val Trp Phe Val Ser Leu Leu Ala Leu Leu Gly Asn |     |     |     |      |
| 420   | 425 | 430 |     |      |
| gtc ttt gtc ctg ctt att ctc ctc acc agc cac tac aaa ctg aac gtc |     |     |     | 1344 |
| Val Phe Val Leu Leu Ile Leu Leu Thr Ser His Tyr Lys Leu Asn Val |     |     |     |      |
| 435   | 440 | 445 |     |      |
| ccc cgc ttt ctc atg tgc aac ctg gcc ttt gcg gat ttc tgc atg ggg |     |     |     | 1392 |
| Pro Arg Phe Leu Met Cys Asn Leu Ala Phe Ala Asp Phe Cys Met Gly |     |     |     |      |
| 450   | 455 | 460 |     |      |
| atg tac ctg ctc ctc atc gcc tct gta gac ctc tac act cac tct gag |     |     |     | 1440 |
| Met Tyr Leu Leu Leu Ile Ala Ser Val Asp Leu Tyr Thr His Ser Glu |     |     |     |      |
| 465   | 470 | 475 | 480 |      |
| tac tac aac cat gcc atc gac tgg cag aca ggc cct ggg tgc aac acg |     |     |     | 1488 |
| Tyr Tyr Asn His Ala Ile Asp Trp Gln Thr Gly Pro Gly Cys Asn Thr |     |     |     |      |
| 485   | 490 | 495 |     |      |
| gct ggt ttc ttc act gtc ttt gca agc gag tta tcg gtg tat acg ctg |     |     |     | 1536 |
| Ala Gly Phe Phe Thr Val Phe Ala Ser Glu Leu Ser Val Tyr Thr Leu |     |     |     |      |
| 500   | 505 | 510 |     |      |
| acg gtc atc acc ctg gag cgc tgg tat gcc atc acc ttc gcc atg gcc |     |     |     | 1584 |
| Thr Val Ile Thr Leu Glu Arg Trp Tyr Ala Ile Thr Phe Ala Met Ala |     |     |     |      |
| 515   | 520 | 525 |     |      |
| ctg gac cgg aag atc cgc ctc agg cac gca tgt gcc atc atg gtt ggg |     |     |     | 1632 |
| Leu Asp Arg Lys Ile Arg Leu Arg His Ala Cys Ala Ile Met Val Gly |     |     |     |      |
| 530   | 535 | 540 |     |      |
| ggc tgg gtt tgc tgc ttc ctt ctc gcc ctg ctt cct ttg gtg gga ata |     |     |     | 1680 |
| Gly Trp Val Cys Cys Phe Leu Leu Ala Leu Leu Pro Leu Val Gly Ile |     |     |     |      |

# Sequence Listing

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| 545   | 550 | 555 | 560 |      |
|---|-----|-----|-----|------|
| agt agc tat gcc aaa gtc agt atc tgc ctg ccc atg gac acc gag acc |     |     |     | 1728 |
| Ser Ser Tyr Ala Lys Val Ser Ile Cys Leu Pro Met Asp Thr Glu Thr |     |     |     |      |
| 565   | 570 | 575 |     |      |
| cct ctt gct ctg gca tat att gtt ttt gtt ctg acg ctc aac ata gtt |     |     |     | 1776 |
| Pro Leu Ala Leu Ala Tyr Ile Val Phe Val Leu Thr Leu Asn Ile Val |     |     |     |      |
| 580   | 585 | 590 |     |      |
| gcc ttc gtc atc gtc tgc tgc tgt tat gtg aag atc tac atc aca gtc |     |     |     | 1824 |
| Ala Phe Val Ile Val Cys Cys Cys Tyr Val Lys Ile Tyr Ile Thr Val |     |     |     |      |
| 595   | 600 | 605 |     |      |
| cga aat ccg cac aac cca ggg gac aaa gat acc aaa att gcc aag agg |     |     |     | 1872 |
| Arg Asn Pro His Asn Pro Gly Asp Lys Asp Thr Lys Ile Ala Lys Arg |     |     |     |      |
| 610   | 615 | 620 |     |      |
| atg gct gtg ttg atc ttc acc gac ttc acg tgc atg gcc cca atc tca |     |     |     | 1920 |
| Met Ala Val Leu Ile Phe Thr Asp Phe Thr Cys Met Ala Pro Ile Ser |     |     |     |      |
| 625   | 630 | 635 | 640 |      |
| ttc tat gct gtg tca gca att ctg aac aag cct ctc atc act gtt agc |     |     |     | 1968 |
| Phe Tyr Ala Val Ser Ala Ile Leu Asn Lys Pro Leu Ile Thr Val Ser |     |     |     |      |
| 645   | 650 | 655 |     |      |
| aac tcc aaa atc ttg ctg gta ctc ttc tat cca att aac tcc tgt gcc |     |     |     | 2016 |
| Asn Ser Lys Ile Leu Leu Val Leu Phe Tyr Pro Ile Asn Ser Cys Ala |     |     |     |      |
| 660   | 665 | 670 |     |      |
| aat cca ttc ctc tat gct att ttc acc aag gcc ttc cag agg gat gtg |     |     |     | 2064 |
| Asn Pro Phe Leu Tyr Ala Ile Phe Thr Lys Ala Phe Gln Arg Asp Val |     |     |     |      |
| 675   | 680 | 685 |     |      |
| ttc atc cta ctc agc aag ttt ggc atc tgt aaa cgc cag gct cag gca |     |     |     | 2112 |
| Phe Ile Leu Leu Ser Lys Phe Gly Ile Cys Lys Arg Gln Ala Gln Ala |     |     |     |      |
| 690   | 695 | 700 |     |      |
| tac cgg ggg cag agg gtt cct cca aag aac agc act gat att cag gtt |     |     |     | 2160 |
| Tyr Arg Gly Gln Arg Val Pro Pro Lys Asn Ser Thr Asp Ile Gln Val |     |     |     |      |

# Sequence Listing

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705              710              715              720

caa aag gtt acc cac gac atg agg cag ggt ctc cac aac atg gaa gat      2208
Gln Lys Val Thr His Asp Met Arg Gln Gly Leu His Asn Met Glu Asp
              725              730              735

gtc tat gaa ctg att gaa aac tcc cat cta acc cca aag aag caa ggc      2256
Val Tyr Glu Leu Ile Glu Asn Ser His Leu Thr Pro Lys Lys Gln Gly
              740              745              750

caa atc tca gaa gag tat atg caa acg gtt ttg          t aa      2292
Gln Ile Ser Glu Glu Tyr Met Gln Thr Val Leu
              755              760

<210>  2
<211>  763
<212>  PRT
<213>  Homo sapiens

<400>  2
Met Arg Pro Ala Asp Leu Leu Gln Leu Val Leu Leu Leu Asp Leu Pro
  1              5              10              15

Arg Asp Leu Gly Gly Met Gly Cys Ser Ser Pro Pro Cys Glu Cys His
      20              25              30

Gln Glu Glu Asp Phe Arg Val Thr Cys Lys Asp Ile Gln Arg Ile Pro
      35              40              45

Ser Leu Pro Pro Ser Thr Gln Thr Leu Lys Leu Ile Glu Thr His Leu
      50              55              60

Arg Thr Ile Pro Ser His Ala Phe Ser Asn Leu Pro Asn Ile Ser Arg
      65              70              75              80

Ile Tyr Val Ser Ile Asp Val Thr Leu Gln Gln Leu Glu Ser His Ser
      85              90              95

Phe Tyr Asn Leu Ser Lys Val Thr His Ile Glu Ile Arg Asn Thr Arg

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# Sequence Listing

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|   |     |     |
|---|-----|-----|
| 100   | 105 | 110 |
| Asn Leu Thr Tyr Ile Asp Pro Asp Ala Leu Lys Glu Leu Pro Leu Leu |     |     |
| 115   | 120 | 125 |
| Lys Ser Leu Ala Phe Ser Asn Thr Gly Leu Lys Met Phe Pro Asp Leu |     |     |
| 130   | 135 | 140 |
| Thr Lys Val Tyr Ser Thr Asp Ile Phe Phe Ile Leu Glu Ile Thr Asp |     |     |
| 145   | 150 | 155 |
|   |     | 160 |
| Asn Pro Tyr Met Thr Ser Ile Pro Val Asn Ala Phe Gln Gly Leu Cys |     |     |
| 165   | 170 | 175 |
| Asn Glu Thr Leu Thr Leu Lys Leu Tyr Asn Asn Gly Phe Thr Ser Val |     |     |
| 180   | 185 | 190 |
| Gln Gly Tyr Asp Phe Phe Gly Thr Lys Leu Asp Ala Val Tyr Leu Asn |     |     |
| 195   | 200 | 205 |
| Lys Asn Lys Tyr Leu Thr Val Ile Asp Lys Asp Ala Phe Gly Gly Val |     |     |
| 210   | 215 | 220 |
| Tyr Ser Gly Pro Ser Leu Leu Asp Val Ser Gln Thr Ser Val Thr Ala |     |     |
| 225   | 230 | 235 |
|   |     | 240 |
| Leu Pro Ser Lys Gly Leu Glu His Leu Lys Glu Leu Ile Ala Arg Asn |     |     |
| 245   | 250 | 255 |
| Ser Trp Thr Leu Lys Lys Leu Ala Leu Ser Leu Ser Phe Leu His Leu |     |     |
| 260   | 265 | 270 |
| Thr Arg Ala Asp Leu Ser Tyr Pro Ser His Cys Cys Ala Phe Lys Asn |     |     |
| 275   | 280 | 285 |
| Gln Lys Lys Ile Arg Gly Ile Leu Glu Ser Leu Met Cys Asn Glu Ser |     |     |
| 290   | 295 | 300 |
| Ser Ile Glu Thr Leu Arg Gln Arg Lys Ser Val Asn Ala Leu Asn Ser |     |     |
| 305   | 310 | 315 |
|   |     | 320 |

## Sequence Listing

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Pro Leu His Gln Glu Tyr Glu Glu Asn Leu Gly Asp Ser Ile Val Gly  
                   325                          330                          335

Tyr Lys Glu Lys Ser Lys Phe Gln Asp Thr His Asn Asn Ala His Tyr  
                   340                          345                          350

Tyr Val Phe Phe Glu Glu Gln Glu Asp Glu Ile Ile Gly Phe Gly Gln  
                   355                          360                          365

Glu Leu Lys Asn Pro Gln Glu Glu Thr Leu Gln Ala Phe Asp Ser His  
                   370                          375                          380

Tyr Asp Tyr Thr Ile Cys Gly Asp Ser Glu Asp Met Val Cys Thr Pro  
                   385                          390                          395                          400

Lys Ser Asp Glu Phe Asn Pro Cys Glu Asp Ile Met Gly Tyr Lys Phe  
                           405                          410                          415

Leu Arg Ile Val Val Trp Phe Val Ser Leu Leu Ala Leu Leu Gly Asn  
                   420                          425                          430

Val Phe Val Leu Leu Ile Leu Leu Thr Ser His Tyr Lys Leu Asn Val  
                   435                          440                          445

Pro Arg Phe Leu Met Cys Asn Leu Ala Phe Ala Asp Phe Cys Met Gly  
                   450                          455                          460

Met Tyr Leu Leu Leu Ile Ala Ser Val Asp Leu Tyr Thr His Ser Glu  
                   465                          470                          475                          480

Tyr Tyr Asn His Ala Ile Asp Trp Gln Thr Gly Pro Gly Cys Asn Thr  
                           485                          490                          495

Ala Gly Phe Phe Thr Val Phe Ala Ser Glu Leu Ser Val Tyr Thr Leu  
                   500                          505                          510

Thr Val Ile Thr Leu Glu Arg Trp Tyr Ala Ile Thr Phe Ala Met Ala  
                   515                          520                          525



# Sequence Listing

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Leu Asp Arg Lys Ile Arg Leu Arg His Ala Cys Ala Ile Met Val Gly  
 530 535 540

Gly Trp Val Cys Cys Phe Leu Leu Ala Leu Leu Pro Leu Val Gly Ile  
 545 550 555 560

Ser Ser Tyr Ala Lys Val Ser Ile Cys Leu Pro Met Asp Thr Glu Thr  
 565 570 575

Pro Leu Ala Leu Ala Tyr Ile Val Phe Val Leu Thr Leu Asn Ile Val  
 580 585 590

Ala Phe Val Ile Val Cys Cys Cys Tyr Val Lys Ile Tyr Ile Thr Val  
 595 600 605

Arg Asn Pro His Asn Pro Gly Asp Lys Asp Thr Lys Ile Ala Lys Arg  
 610 615 620

Met Ala Val Leu Ile Phe Thr Asp Phe Thr Cys Met Ala Pro Ile Ser  
 625 630 635 640

Phe Tyr Ala Val Ser Ala Ile Leu Asn Lys Pro Leu Ile Thr Val Ser  
 645 650 655

Asn Ser Lys Ile Leu Leu Val Leu Phe Tyr Pro Ile Asn Ser Cys Ala  
 660 665 670

Asn Pro Phe Leu Tyr Ala Ile Phe Thr Lys Ala Phe Gln Arg Asp Val  
 675 680 685

Phe Ile Leu Leu Ser Lys Phe Gly Ile Cys Lys Arg Gln Ala Gln Ala  
 690 695 700

Tyr Arg Gly Gln Arg Val Pro Pro Lys Asn Ser Thr Asp Ile Gln Val  
 705 710 715 720

Gln Lys Val Thr His Asp Met Arg Gln Gly Leu His Asn Met Glu Asp  
 725 730 735

Val Tyr Glu Leu Ile Glu Asn Ser His Leu Thr Pro Lys Lys Gln Gly

## Sequence Listing

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740

745

750

Gln Ile Ser Glu Glu Tyr Met Gln Thr Val Leu

755

760